1. Machine learning is a type of artificial intelligence that enables computer systems to learn from experience, without being explicitly programmed. It works by analyzing large datasets to identify patterns and relationships, and then using these to make predictions or decisions. Two examples of machine learning applications in the business world are fraud detection and customer segmentation. However, machine learning applications could raise ethical concerns such as data privacy, bias, and discrimination.

2.

i. Under the supervision of experts: In this type of learning, an expert provides direct guidance and feedback to the learner. For example, a teacher instructing a student in a classroom setting.

ii. With the assistance of experts in an indirect manner: In this type of learning, the learner receives assistance from experts, but not necessarily directly. For example, an online tutorial or instructional video.

iii. Self-education: In this type of learning, the learner is responsible for their own education and learning. For example, reading books or conducting independent research.

3. Types of machine learning include supervised learning, unsupervised learning, reinforcement learning, and deep learning.

4. Forms of machine learning include supervised learning, unsupervised learning, semi-supervised learning, reinforcement learning, and deep learning.

5. A well-posed learning problem has well-defined inputs and outputs, a clear objective, and access to sufficient data to train the model. It must also be possible to evaluate the model's performance and measure its success.

6. No, machine learning is not capable of solving all problems. It is only effective when there is enough data available to train the model and when the problem is well-posed.

7. Methods and technologies for solving machine learning problems include decision trees, neural networks, support vector machines, clustering, and deep learning. Two of them defined in detail are decision trees and neural networks.

8. Supervised learning includes classification and regression. Classification involves categorizing data into predefined classes, such as predicting whether an email is spam or not. Regression involves predicting a numerical value, such as the price of a house based on its characteristics.

9. The main difference between supervised and unsupervised learning is that supervised learning requires labeled data, while unsupervised learning does not. A sample application of supervised learning is image recognition, while an example of unsupervised learning is clustering customer data to identify patterns.

10. The machine learning process includes data collection, data preprocessing, model training, model evaluation, and model deployment.

a. Brief notes on two of the following:

- MATLAB is a popular programming language used for machine learning applications due to its extensive library of functions and toolboxes.

- Deep learning applications in healthcare involve using machine learning algorithms to analyze medical data and make predictions, such as predicting patient outcomes or identifying potential health risks.

11.

1. Generalization refers to the ability of a model to perform well on new, unseen data, while abstraction involves simplifying complex information to identify patterns and relationships.

2. Guided learning involves receiving feedback or guidance from experts, while unsupervised learning involves finding patterns in data without any guidance.

3. Regression involves predicting a numerical value, while classification involves categorizing data into predefined classes.